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Office of Transportation and Air Quality

Technical Bulletin

Truck Stop Electrification

Truck stop electrification is one technology available to trucking fleets and truck stop operators to reduce fuel use and eliminate the emissions associated with long duration engine idling at truck stops.

Background

Truck stops are an integral part of America's over-the-road transport system. According to a recent study by the Department of Transportation (DOT) [www.dot.gov/affairs/fhwa2802.htm], the United States has approximately 5,000 truck stops with an estimated 320,000 truck parking spaces. Different truck stops offer different services. Almost all have fueling stations. Some have restaurants, showers, stores, laundry facilities, and other amenities. Some merely have restrooms and a parking lot.

Truck drivers use these locations generally to re-fuel and/or rest. The time spent at a truck stop varies with the needs of the truck driver and the services offered. The DOT mandates that for every 10 hours driving, a truck driver must rest for 8 hours. During this rest period, truck drivers will often idle their engines to provide their sleeper compartment with air conditioning, heat, and electrical power to run appliances such as a refrigerator, microwave oven, and television. They may also idle their engines to keep their engines and fuel warm in cold weather.

Use of these components substantially increases the fuel consumption and air emissions from the truck. As documented in EPA's long-duration truck idling test program [www.epa.gov/otaq/retrofit/documents/r02025.pdf], use of the air conditioning or heat requires higher engine speeds, thereby increasing fuel consumption above 1 gallon per hour.

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Benefits

Use of truck stop electrification can reduce emissions by 90 percent and save 100 percent of the diesel fuel for the time spent idling. This technology can reduce 24 tons of carbon dioxide and .34 tons of nitrogen oxides per truck annually. Fuel savings per year will amount to $3,240 per truck parking space.

Alternatives

Truck stop electrification (TSE) refers to a technology that harnesses an electrical system to provide the truck driver with their needs, eliminating the need to run their engines. It can be a stand-alone system or it can include a combined on-board and off-board system.

- Stand-alone TSE refers to an independent system that supplies the truck driver's needs without modifying the truck. A structure is built above truck parking spaces and HVAC (heating, ventilation, and air conditioning) systems are suspended on this structure above each parking space. A hose comes down from the HVAC and attaches to the truck window or portal near the sleeper compartment. On the face of the hose's opening is a computer touch-screen for conducting financial transactions as well as outlets to plug in appliances, telephones and computers. The system is owned by a private company which operates and services the system. The company charges an hourly fee and the truck driver is required to purchase a window template to accommodate the hose. Refer to EPA's list of idle reduction technologies for manufacturers of on-board truck stop electrification [www.epa.gov/otaq/retrofit/idlingtech.htm].

- For the truck driver, on-board TSE (also known as "shore-power") requires that the truck come equipped with three essential components: (1) an inverter to convert 120 volts to operate on-board appliances (and a charger to re-charge the truck's battery if an electrical outlet is not available), (2) an electrical HVAC system to provide heat and air which is powered by the electricity; and (3) hardware to plug-into the electrical outlet.

- For the truck stop operator, on-board TSE requires an electrical outlet for the truck to plug into. The truck stop operator would regulate its use and charge. A few truck stops currently provide outlets for truck drivers to use. If no electrical outlet is available, the truck could use battery power to operate the electrical HVAC. Refer to EPA's list of idle reduction technologies for manufacturers of on-board TSE.

Challenge

The greatest difficulty with truck stop electrification is availability. Truck manufacturers are reluctant to include on-board systems because of the lack of available electrical outlets, and truck stop operators are equally reluctant to introduce shore power truck stop electrification because of the lack of trucks equipped with on-board systems. While stand alone truck stop electrification does not require on-board components, truck stop operators fear the lack of a customer base, so few stand alone truck stop electrification systems are currently available**.**

EPA's Course of Action

EPA's goal is to bring together the industry members (truck manufacturers, truck stop operators, trucking fleets, and truck stop electrification manufacturers) as part of the National Transportation Idle-Free Corridors project. This project will assist industry and states in working together to solve the issues about truck stop electrification availability. To start, EPA plans to host meetings and workshops to bring the industry and government partners together to identify and resolve issues. In the future, EPA anticipates issuing a state grant program to assist in the deployment of truck stop electrification, and an industry contract to assist private fleets with the purchase of on-board idle reduction technologies.

For More Information

You can access documents on idling reduction electronically on the Office of Transportation and Air Quality Web site at:

www.epa.gov/otaq/retrofit/idling.htm

You can also contact the OTAQ library for document information at:

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